

Ten-stage S-1 photomultiplier for low-level red and near-infrared detection, spectrometry, ranging, astronomy, and optical pyrometry.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	— / —	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Photomultiplier

No fixed ratings recorded.

Source-derived section; promoted values populated where applicable.

7102 MULTIPLIER PHOTOTUBE .24" Dia. Flat 10-Stage, Head-On Type 4.57" Max. Length
Semitransparent S-1 Response 1.56" Max. Diameter Photocathode Capable of Very Short Time-Resolution
Duodecal 12-Pin Base TENTATIVE DATA RCA-7102 is a head-on type of multiplier window: h b intended f .
the detect i d Area 1.2 sq. in. phototube intende or use in € detection an Minimum diameter
. . . . 1.24 in. measurement of low-level red and near—infrared Index of refraction. . P 5 radiation. it is
well suited Direct Interelectrode Capacitances (Approx.): R R Anode to dynode No.10 4 ppf for
use inred and near-infrared Anode to all other electrodes. 7 upf spectrometry, infrared ranging,
Maximum Overall Length . . . + v .« « ¢ v 4 4 4,57". + . | R Seated Length. 00 00 3.88" + 0.19"
astronomical measurements in- Maximum Diameter . . « . « . 4 4 4 . . 1.56" volving near—infrared radi-
Bulo. T-12 : ation, - optical pyrometry, and Bzse =

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1940 RCA

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1940 RCA

Section 1 · Photomultiplier

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
The spectral response of ANODE-SUPPLY VOLTAGE (DC or Peak AC) . 1500 max. volts	1500 V	The spectral response of ANODE-SUPPLY VOLTAGE (DC or Peak AC) . 1500 max. volts
SUPPLY VOLTAGE BETWEEN DYNODE No	10 V	SUPPLY VOLTAGE BETWEEN DYNODE No.10
the 7102 covers the range from AND ANODE (DC oF Peak AC). 250 max. volts	250 V	the 7102 covers the range from AND ANODE (DC oF Peak AC). 250 max. volts
about 4200 to 11000 angstroms SUPPLY VOLTAGE BETWEEN CATHODE AND	11000 V	about 4200 to 11000 angstroms SUPPLY VOLTAGE BETWEEN CATHODE AND
as shown i Fi Max i DYNODE No.1 (DC or Peak AC). « » « « « . . 400 max. volts	400 V	as shown i Fi Max i DYNODE No.1 (DC or Peak AC). « » « « « . . 400 max. volts
cathode having a minimum dia- With E = 1250 volts (except as noted)	1250 V	cathode having a minimum dia- With E = 1250 volts (except as noted)
electrostatically focused dynode stages. The rela~- 8000 angstroms - 400 - pa/	400	electrostatically focused dynode stages. The rela~- 8000 angstroms - 400 - pa/
8000 angstroms . _ 0.0027 _ pal ww	0.0027	8000 angstroms . _ 0.0027 _ pal ww
At 0 cps 1 4.5 30 amp /	1 A	At 0 cps 1 4.5 30 amp /1umen
resolution. Foran input pulse having a duration electrode™ . . - 2.7 - amp/	1 A	resolution. Foran input pulse having a duration electrode™ . . - 2.7 - amp/1umen
seconds measured at 50 per cent of the maximum w';gulrgzg:(lggg	50 s	seconds measured at 50 per cent of the maximum w';gulrgzg:(lggg

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
R current Amplification	150000	... R current Amplification - 150000 -
microseconds. The transit-time spread can be re- park-current Input® - 3.3 x 10T 5.5 x	1078 W	microseconds. The transit-time spread can be re — park-current Input® - 3.3 x 10T 5.5 x 1078 watt
1.5 x 10719 8.4 10	-10 W	1.5 x 10719 8.4 10-10 watt
only a small central area of the photocathode. With E = 1500 volts (except as noted)	1500 V	only a small central area of the photocathode. With E = 1500 volts (except as noted)
DATA Radiant, at 8000 angstroms . . — 1250 - ual pw	1250	DATA Radiant, at 8000 angstroms . . — 1250 - ual pw
General: angstroms. « + + « ¢ 4 . . . — 0.0027 - pal	0.0027	General: angstroms. « + + « ¢ 4 . . . — 0.0027 - pal
wavelength of Maximum Response . . 8000 % 1000 angstroms AL O CPS « v v v e e . = 14 ~ amp/umen	14 A	wavelength of Maximum Response . . 8000 % 1000 angstroms AL O CPS « v v v e e . = 14 ~ amp/umen
Shape. Circular electrode™ e e e = 8.4 - amp/lumen	8.4 A	Shape. Circular electrode™ e e e = 8.4 - amp/lumen
current Amplification	465000	current Amplification. . . . - 465000 -
b Averaged over any interval of 30 seconds maximum	30 s	b Averaged over any interval of 30 seconds maximum.
the value of light flux is 0.01 lumen and 150 volts i EMAX, VALUET T	150 V	the value of light flux is 0.01 lumen and 150 volts i EMAX, VALUET T
T Measured at 8000 angstroms. z	8000	T Measured at 8000 angstroms. z
supply voltage (E) adjusted to give a luminous sensi- I	1 V	supply voltage (E) adjusted to give a luminous sensi- I 1
tivity of 4 amperes per lumen. Dark current caused by z	4 A	tivity of 4 amperes per lumen. Dark current caused by z
1250 volts, 259 ¢ tube temperature, ac-amplifier band— <	60 V	1250 volts, 259 ¢ tube temperature, ac-amplifier band— < 60
width of 1 cycle per second, tungsten light source at f i	1 s	width of 1 cycle per second, tungsten light source at f i
incident luminous flux, at constant electrode voltages 3000 5000 00	11000 V	incident luminous flux, at constant electrode voltages 3000 5000 00 3000 11000

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
2870° K SOURCE AFTER PASSING THROUGH tn general, the operating voltages for the	2870 V	2870° K SOURCE AFTER PASSING THROUGH tn general, the operating voltages for the
100 to 125 volts. The voltage between dynode	125 V	100 to 125 volts. The voltage between dynode
3000 5000 7000 9000 11000 tain the indicated operating voltage between	11000 V	3000 5000 7000 9000 11000 tain the indicated operating voltage between
to the rated maximum value of	400 V	to the rated maximum value of 400 volts.
the cathode can not be detected. The dark cur-- the maximum rated value of 10 microamperes is	10 A	the cathode can not be detected. The dark cur— the maximum rated value of 10 microamperes is
EACH SUCCEEDING ~DYNODE - STAGE VOLTS	104 V	EACH SUCCEEDING ~DYNODE - STAGE VOLTS 104 T
I-10: DYNODES I LAMP OPERATED AT COLOR TEMPERATURE =	10	I-10: DYNODES I LAMP OPERATED AT COLOR TEMPERATURE =
VOLTS BETWEEN ANODE & DYNODE N	10 V	VOLTS BETWEEN ANODE & DYNODE N210
(E) in the range from (000 to 1250 volts. With--	1250 V	(E) in the range from (000 to 1250 volts. With—
second. At voltages above 1250 volts, regener--	1250 V	second. At voltages above 1250 volts, regener—
ice, tocool the bulb of the 7201 is recommended. ANODE MICROAMPERES	7201 A	ice, tocool the bulb of the 7201 is recommended. ANODE MICROAMPERES
When stability of operation 1s important, amplification per stage raised to the nth power,	1	When stability of operation 1s important, amplification per stage raised to the nth power,
smal! variations in amplification per stage pro- With certain orientations of the 7102, it	7102	smal! variations in amplification per stage pro- With certain orientations of the 7102, it
to be able to adjust the amplification of indi- indicated. With increase in voltage above	100 V	to be able to adjust the amplification of indi- indicated. With increase in voltage above 100
OF £ BETWEEN DYNODE N210 AND ANODE. SUPPLY VOLTAGE (E) ACROSS VOLTAGE DIVIDER PROVIDING	10 V	OF £ BETWEEN DYNODE N210 AND ANODE. SUPPLY VOLTAGE (E) ACROSS VOLTAGE DIVIDER PROVIDING

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
— AMPERES/ LUMEN b	5115 A	— AMPERES/ LUMEN b 5115 !
voltage—adjustment range required to take care > SI87a17% &	7 V	voltage—adjustment range required to take care > SI87a17% &
determined from Fig.7. For example, if a sensi~ a g LAY =	8	determined from Fig.7. For example, if a sensi~ a g LAY = 8
age of about 1250 volts, and on the '"maximum" g 2 i/	2 V	age of about 1250 volts, and on the '"maximum" g 2 i/ 2
sensitivity curve to a supply voltage of	910 V	sensitivity curve to a supply voltage of 910 r
volts. Therefore, provision should be made to 0.0l /	100 V	volts. Therefore, provision should be made to 0.0l / 100
910 to 1250 volts. L	7 V	910 to 1250 volts. L 7
10 megohms to a potential near that of the cath	10 ohm	10 megohms to a potential near that of the cath-
pedance in the order of 0 megohms to the poten- The dc¢ supply voltages for the electrodes	0 V	pedance in the order of 0 megohms to the poten- The dc¢ supply voltages for the electrodes
@ 10°] DYNODE-N2{-TO- CATHODE VOLTS =	6 V	@ 10°] DYNODE-N2{-TO- CATHODE VOLTS = 208 (6°
S EACH-SUCCEEDING-DYNODE - STAGE VOLTS =104 r taps on a voltage divider across the rectified	104 V	S EACH-SUCCEEDING-DYNODE - STAGE VOLTS =104 r taps on a voltage divider across the rectified
53 N [ANODE-SUPPLY VOLTAGE = CONSTANT	53 V	53 N [ANODE-SUPPLY VOLTAGE = CONSTANT
Ro _ P ~12 [* TOTAL VOLTAGE-DIVIDER CURRENT /	12 V	Ro _ P ~12 [* TOTAL VOLTAGE-DIVIDER CURRENT /
VOLTS PER STAGE=I	0 V	VOLTS PER STAGE=I100
the leads from the 7102 to the amplifier should the use of a rectifier of the fuli-wave type is	7102	the leads from the 7102 to the amplifier should the use of a rectifier of the fuli-wave type is
recommended. Sufficient filteringwill ordinari- The high voltages at which the %102 ls oper-	1 V	recommended. Sufficient filteringwill ordinari- The high voltages at which the %102 ls oper-

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
tical dependence of the gain of the 7102 on volt-potential terminals and the use of interlock	7102 V	tical dependence of the gain of the 7102 on volt-potential terminals and the use of interlock
€1 €2: 2 uf, 1000 volts (dc working)	1000 V	€1 €2: 2 uf, 1000 volts (dc working)
C1 C2 ¢3: 16 uf, electrolytic, 450 volts (dc working) C3 c¥: 8 uf, electrolytic, 150 volts (dc worki	150 V	C1 C2 ¢3: 16 uf, electrolytic, 450 volts (dc working) C3 c¥: 8 uf, electrolytic, 150 volts (dc working)
c4 ¢5: 8 uf, electrolytic, 150 volts (dc working) Required only if high peak currents are drawn	150 V	c4 ¢5: 8 uf, electrolytic, 150 volts (dc working) Required only if high peak currents are drawn.
R1: 100000 ohms, 1/2 watt R1: 39000 ohms,	2 W	R1: 100000 ohms, 1/2 watt R1: 39000 ohms, 2 watts
R2 R3 R¥ R5 R6 R7 RB 50000 ohms, 1/	2 W	R2 R3 R¥ R5 R6 R7 RB 50000 ohms, 1/2 watt
R9 R10: R2 R3 R4 R5 R6 R7 R8 R9 R10: 18000 ohms,	1 W	R9 R10: R2 R3 R4 R5 R6 R7 R8 R9 R10: 18000 ohms, 1 watt
R11: 33000 ohms, 1/2 watt R11: 12000 ohms,	1 W	R11: 33000 ohms, 1/2 watt R11: 12000 ohms, 1 watt
R12: 100000 ohms, 1 watt, adjustable, Centralapb a122, R12: 200000 ohms, 12 watts, adjustable, Gener	12 W	R12: 100000 ohms, 1 watt, adjustable, Centralapb a122, R12: 200000 ohms, 12 watts, adjustable, General Radio
Circuit with Voltage Divider for Supplying Fig.12- Full-Wave Rectifier Power-Supply Circuit	12 V	Circuit with Voltage Divider for Supplying Fig.12- Full-Wave Rectifier Power-Supply Circuit
DC Voltages to Type 7102. with Voltage Divider for Supplying DC Voltages	7102 V	DC Voltages to Type 7102. with Voltage Divider for Supplying DC Voltages
dc supply voltage is provided by means of a In the use of the 7102, as with other tubes	7102 V	dc supply voltage is provided by means of a In the use of the 7102, as with other tubes

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
mately 8000 angstroms. Characteristics Range Values for Equipment Design	8000	mately 8000 angstroms. Characteristics Range Values for Equipment Design:

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
The load resistance has a value of 0.01 megohm. il	0.01 ohm	The load resistance has a value of 0.01 megohm. il

TUBE TINKER

An independent reference for electronic tubes, vacuum tubes, and their source documents.

[Catalog](#) [Tube types](#) [Full books](#) [Blog](#) [Feedback & corrections](#)

© 2026 Tube Tinker